OPERATION MANUAL

INVERTER MONOTUBE IGBT WELDING MACHINE

（2013 NEW VERSION）

Thank you for your buying our product, for using it correctly, please at first read this manual carefully.

Safety Caution！

On the process of welding or cutting, there will be any possibility of injury, so please take protection into consideration during operation. More details please review the Operator Safety Guide, which complies with the preventive requirements of the manufacturer

Electric shock——may lead to death ！！

- Set the earth fitting according to applying standard.
- It is forbidden to touch the electric parts and electrode when the skin is naked, wearing wet gloves or clothes.
- Make sure you are insulated from the ground and the workshop.
- Make sure you are in safe position.

Gas——may be harmful to health!

- Keep your head out of the gas.
- When arc welding, air extractor should be used to prevent from breathing gas.

Arc radiation——Harmful to your eye and burn your skin.

- Use suitable helmet and light filter, wear protective garment to protect eye and body.
- Use suitable helmet or curtain to protect looker-on.

Fire

- Welding spark may cause fire, make sure the welding area no tinder around.

Noise——extreme noise harmful to ear.

- Use ear protector or others means to protect ear.
- Warn that noise harmful to hearing if looker-on around.

Malfunction——When meet the trouble, count on the professionals

- If trouble in installation and operation, please follow this manual instruction to check up.
- If fail to fully understand the manual, or fail to solve the problem with the instruction, you should contact the suppliers or our service center for professional help.

CAUTION！

Creepage-protecting switch should be added when using the machine！！！

About the machine

The welding machine is a rectifier adopting the most advanced inverter technology.

The development of inverter arc welding equipment profits from the development of the inverter power supply theory and components. Inverter arc welding power source utilizes high-power component monotube IGBT to transfer 50/60HZ frequency up to 50KHZ, then reduce the voltage and commutate, and output high-power voltage via PWM technology. Because of the great reduce of the main transformer's weight and volume; the efficiency increases by 30%. The appearance of inverter welding equipment is considered to be a revolution for welding industry.

With the IGBT's constantly updated, the same volume of a monotube IGBT the power will larger than MOS tube several times, so use the the one monotube IGBT to instead of many more MOS tubes is the development trend of inverter welding machine. This makes the size of inverter welding machine has been dropped again, but the quality once again be raised. Monotube IGBT inverter welding machine came to be praised by experts as another revolution.

The welding power source can offer stronger, more concentrated and more stable arc. When stick and work piece get short, its response will be quicker. It means that it is easier to design into welding machine with different dynamic characteristics, and it even can be adjusted for specialty to make arc softer or harder.

This kind of welding machine has the following characteristics: effective, power saving, compact, stable arc, good welding pool, high no-load voltage, good capacity of force compensation and multi-use. It can weld stainless steel, alloy steel, carbon steel, copper and other color metal. It can apply to electrode of different specifications and materials, including acidity, alkalescence, and fibre. It can apply in high altitude, the open air and inside and outside decoration. Compared with the same products of home and abroad, it is compact in volume, light in weight, easy to install and operate.

CAUTION!

The machine is mainly used in industry. It will produce radio wave, so the worker should make fully preparation for protection.

PARAMETERS

Model / Parameters	MMA-105PI	MMA-120PI	MMA-140PI	MMA-160PI	MMA-180PI	MMA-200PI	MMA-250PI
Power voltage（V）	1phase AC 220V±15%	1phase AC 220V±15%	1phase AC 220V±15%	1phase AC 220V±15%	1phase AC 220V±15%	1phase AC 220V±15%	1 phase AC 220V±15%
Frequency （HZ）	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Rated input current （A）	22	24	26	28	28	32	58
No-load voltage （V）	56	56	56	56	56	62	62
Output current（A）	20-105	20-120	20-140	20-160	20-160	20-200	20-250
Rated input voltage （V）	24.2	24.8	25.6	26.4	26.4	28	30
Force range（A）	----	----	----	----	----	----	----
Duty cycle （%）	80	80	80	80	80	80	80
No-load loss （W）	35	35	40	40	40	40	60
Efficiency	80	80	80	80	80	80	85
Power factor	0.73	0.73	0.73	0.73	0.73	0.73	0.93
Insulation grade	F	F	F	F	F	F	F
Housing protection grade	IP21	IP21	IP21	IP21	IP21	IP21	IP21
Weight （kg）	4.3	5.0	5.5	6.0	6.5	7.0	7.5
Dimensions（mm）	38×19×26	38×19×26	38×19×26	45.5X19X30.5	45.5X19X30.5	45.5X19X30.5	45.5X19X30.5

Model / Parameters	MMA-160I	MMA-180I	MMA-200I	MMA-250I
Power voltage（V）	1phase AC 220V±15%	1phase AC 220V±15%	1phase AC 220V±15%	1 phase AC 220V±15%
Frequency （HZ）	50/60	50/60	50/60	50/60
Rated input current（A）	28	28	32	58
No-load voltage（V）	56	56	62	62
Output current（A）	20-160	20-160	20-200	20-250
Rated input voltage（V）	26.4	26.4	28	30
Force range（A）	----	----	----	----
Duty cycle （%）	80	80	80	80
No-load loss （W）	40	40	40	60
Efficiency	80	80	80	85
Power factor	0.73	0.73	0.73	0.93
Insulation grade	F	F	F	F
Housing protection grade	IP21	IP21	IP21	IP21
Weight （kg）	6.0	6.5	7.0	7.5
Dimensions（mm）	45.5X19X30.5	45.5X19X30.5	45.5X19X30.5	45.5X19X30.5

Structure is same

INSTALLMENT

The machine is equipment with power voltage compensation equipment. When power voltage moves between±15% of rated voltage, it still can work normally.

When use long cable, in order to prevent voltage form going down, bigger section cable is suggested. If cable is too long, it may affect the performance of the power system. So we suggest you to use configured length.

1. Make sure intake of the machine not blocked or covered, lest cooling system could not work.

2. Use inducting cable whose section is not less than 6 mm^2 to connect the housing to the ground. The way is from the ground-connecting screw at the back to the earth device.
3. Correctly connect the arc torch or holder according to the sketch. Make sure the cable, holder and fastening plug have been connected with the ground. Put the fastening plug into the fastening socket at the "-"polarity and fasten it clockwise.
4. Put the fastening plug of the cable to fastening socket of "+" polarity at the front panel, fasten it clockwise, and the earth clamp at the other terminal clamps the work piece.
5. Please pay attention to the connecting polarity, DC welding machine has two connecting ways:positive connection and negative connection.

   Positive connection: holder connects with "-" polarity, while work piece with the "+"polarity.

   Negative connection: work piece with the "-"polarity, holder with the "+" polarity.

   Choose suitable way according to working demands. If unsuitable choice, it will cause unstable arc, more spatters and conglutination. If such problems occur, please change the polarity of the fastening plug.
6. According to input voltage grade, connect power cable with power supply box of relevant voltage grade. Make sure no mistake and make sure the voltage difference among permission range. After the above jobs, installment is finished and welding is available.

If distance of work piece and machine is too far (50-100m), and the cables (torch cable and earth cable) are too long, please choose cable of bigger section to minimize the reduction of the voltage.

OPERATION

1. Open the power switch, screen will show set current volume and ventilator is beginning to revolve.
2. Adjust knobs of welding current and arc-striking push, make welding function complies with demands.

3.Generally, welding current is adequate to welding electrode according with as following:

Specification	Φ 2.5	Φ 3.2	Φ 4.0	Φ 5.0
Current	60-100A	80-140A	140-220A	220-250A

4.If the welding machine put into the TIG function: then it will be in the TIG contact strike function, set the machine with TIG torch, it will be in working status.

warning!

Before connecting operation please make sure all the power is turned off. The right order is to connect the welding cable and ground cable to the machine first, and make sure they are firmly connected and then put the power plug to the power source.

PANEL INSTRUCTION

1. POWER INDICATOR LIGHT
2. ABNORMAL INDICATOR LIGHT
3.CURRENT ADJUSTING KNOB
4.POSITIVE OUTPUT
5. NEGATIVE OUTPUT
6.MMA/TIG FUCTION EXCHANGE KNOB

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The panel picture above is for reference only. If any difference with the real machine, please follow with the real

machine.

NOTES OR PREVENTIVE MEASURES

1、Environment

1）The machine can perform in environment where conditions are dry with a dampness lever of max 90%.

2）Ambient temperature is between subzero10 to 40 degrees centigrade.

3）Avoid welding in sunshine or drippings.

4）Do not use the machine in environment where condition is polluted with conductive dust on the air or corrosiveness gas on the air.

5）Avoid gas welding in the environment of strong airflow.

2、Safety norms

The welding machine has installed protection circuit of over voltage and current and heat. When voltage and output current and temperature of machine are exceeding the rated standard, the welding machine will stop working automatically. Because that will be damage to welding machine, user must pay attention as following:

1）**The working area is adequately ventilated！**

The welding machine is powerful machine, when it is being operated, it generated by high currents, and natural wind will not satisfy machine cooling demands. So there is a fan in inter-machine to cool down it. Make sure the intake is not in block or covered, it is 0.3 meter from welding machine to objects of environment. User should make sure the working area is adequately ventilated. It is important for the performance and the longevity of the machine.

2）**Do not over load！**

The operator should remember to watch the max duty current (Response to the selected duty cycle). Keep welding current is not exceed max duty cycle current.

Over-load current will damage and burn up machine.

3）**No over voltage！**

Power voltage can be found in diagram of main technical data. Automatic compensation circuit of voltage will assure that welding current keep in allowable arrangement. If power voltage is exceeding allowance arrangement limited, it will damage to components of machine. So the operator should understand the situation and take preventive measures.

4）There is a grounding screw behind welding machine, there is grounding marker on it Mantle must be grounded reliable with cable which section is over 6 square millimeter in order to prevent from static electricity and leaking.

5）If welding time is exceeded duty cycle limited, welding machine will stop working for protection. Because machine is overheated, temperature control switch is on “ON” position and the indicator light is red. In this situation, you don’t have to pull the plug, in order to let the fan cool the machine. When the indicator light is off, and the temperature goes down to the standard range, it can weld again.

QUESTIONS TO BE RUN INTO DURING WELDING

Fittings, welding materials, environment factor, supply powers maybe have something to do with welding. User must try to improve welding environment.

A、Arc-striking is difficult and easy to pause

1. Make sure quality of electrode is high .
2. If the electrode is not dried, it will cause unstable arc, welding defect increases and the quality is down.
3. If use extra-long cable, the output voltage will decrease, so please shorten the cable

.

B、Output current not to rated value:

When power voltage departs from the rated value, it will make the output current not matched with rated value; When voltage is lower than rated value, the max output may lower than rated value.

C、Current is not stabilizing when machine is been operating:

It has something with factors as following :

1. Electric wire net voltage has been changed .
2. There is harmful interference from electric wire net or other equipment

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D、When use MMA welding, too much spatter

1. Maybe current is too big and stick's diameter is too small.
2. Output terminal polarity connection is wrong, it should apply the opposite polarity at the normal technics, which means that the stick holder should be connected with the negative polarity of power source, and work piece should be connected with the positive polarity. So please change the polarity.

MAINTENANCE

1、Remove dust by dry and clean compressed air regularly, if welding machine is operating in environment where is polluted with smokes and pollution air, the machine need remove dust everyday.

2、Pressure of compressed air must be inside the reasonable arrangement in order to prevent damaging to small components of inter-machine.

3、Check inter circuit of welding machine regularly and make sure the cable of Circuit is connected correctly and connectors are connected tightly (especially insert connector and components). If scale and loose are found, please give a good polish to them, then connect them again tightly.

4、Avoid water and steam enter into inter-machine, if them enter into machine, please dry inter-machine then check insulation of machine.

5、If welding machine will not be operated long time, it must be put into packing box and store in dry environment.

CHECK FAULT

Notes: If user wants to operate machine as following, the operator must be a personnel in a specific field of electricity and safety and hold the relevant certificate that proves there ability and knowledge. Before maintenance, contact with our company for authorization is suggested.

Fault	Resolvable methods
Indicator of power switch is not lit, fan is not working and there is not welding output.	A. Make sure power switch is "on". B. Make sure the input cable with the power.
Power indicator is lit, fan does not work and there is no welding output.	A. .220v power is not stabilizing (input cable is too slender) or input cable is connected to electrify wire net cause machine is in protection circuit. Increase the section of input cable and tighten input connector firmly. Close machine 5-10 minutes then open it again. B. Open and close power switch in short time cause protection circuit is working. Close machine and open it again after 5-10 minutes. C. Cables are relaxed between power switch and power source board, tighten them again.
Fan is working, welding current is not stabilizing or out of regulation resistance control, current is sometimes low and sometimes high.	A. Quality of 1K regulation resistance is broke, replace it. B. Terminal of output is broken circuit or poor connect, need to check it out.
Fan is working and abnormal indicator is not lit, there is no welding output.	A. Check if components are poor connects. B. Check if connector of output terminal is break circuit and poor connect. C. Check voltage between power source board and MOS board (VH-07) is about DC 308v. D. If green indicator is not lit in assistant power of MOS board, please connect with seller or our company and replace it. E. If there is some question in control circuit, please connect with seller or our company and replace it.
Fan is working and abnormal indicator is lit, but there is no welding output.	A. Maybe over-current protection is working, please close machine and waiting. After abnormal indicator is not on, open machine. B. Maybe overheated protection is working, wait for 5-10 minutes. C. Maybe inverter circuit is in fault; (1) May be the IGBT is broke, please check and replace it. (2) Maybe some of secondary rectifier tube of transformer is broken, check and replace rectifier tube. D. Maybe feedback circuit is in fault.